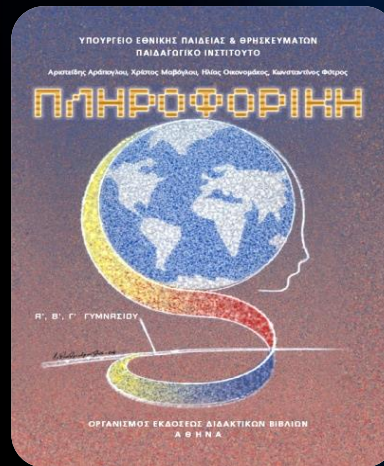# MULTIMEDIA

CHAPTER 3.1

KEY WORDS

MULTIMEDIA

INTERACTIVITY

LINEAR & NO-LINEAR

BITMAP IMAGE

VECTOR IMAGE

RESOLUTION

COLOR DEPTH

RGB MODEL

MULTIMEDIA = 5 MEDIA

- TEXT
- GRAPHICS
- SOUND
- ANIMATION
- VIDEO

MULTIMEDIA FEATURES

- It is a kind of technology that **combines** various forms of **media** in order to better represent the information provided to the user.

  - **Text**
  - **Sound**
  - **Graphics Sound**   Media forms
  - **Animation**
  - **Video**

- In multimedia technology many pieces of information are interconnected in a **non-linear** way.

- It allows users to develop an **interactive** relationship with computers, so as to be able to select any kind of information needed.

INTERACTIVITY
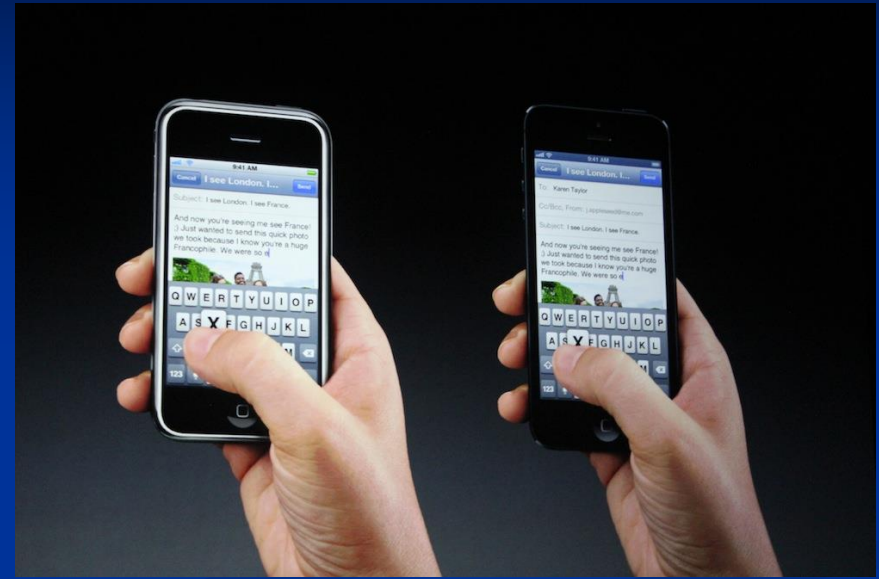
NO-LINEAR APPLICATIONS

- The most important feature of multimedia technology is **interactivity** with which in a non-linear application, the user:

    - is **not a passive user** of application who just watches the information provided but he has also the ability to determine the way it is displayed.

    - is an active user who determines the **form**, the **order** and the **speed** of information each time he uses an application.

EXAMPLES OF
LINEAR & NO-LINEAR APPS

Linear	No Linear
School book	Educational software (e-books)
Encyclopedia	Electronic encyclopedia
Book pages	Webpages
TV channels	Computer, Web-TV
Video (VCR)	DVD Player

NO-LINEAR WEB-SITES

NO-LINEAR APPLICATIONS

ELECTRONIC ENCYCLOPEDIAS

EDUCATIONAL SOFTWARE

EDUCATIONAL SOFTWARE

V. C. Zioulas (IT Teacher)
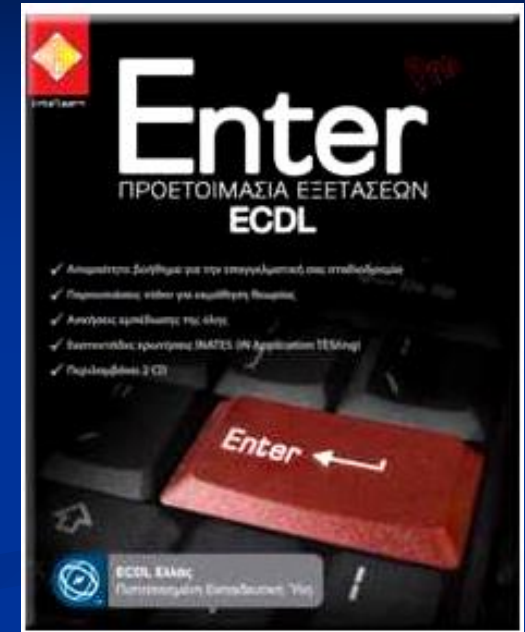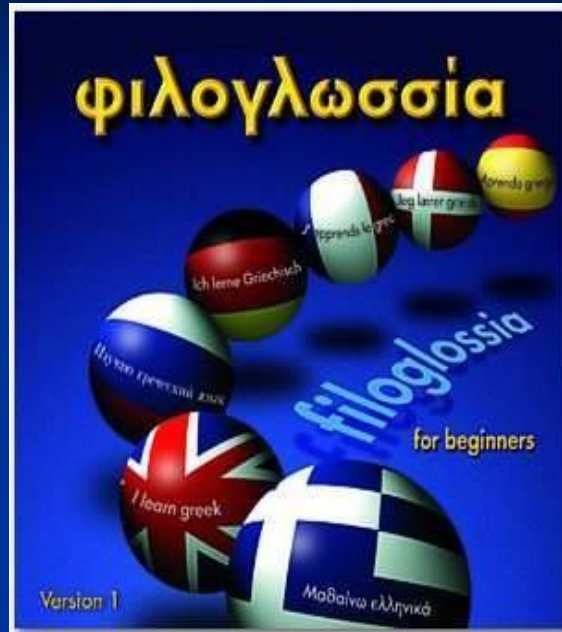
MULTIMEDIA EQUIPMENT

- Nowadays, there is a wide variety of **input** and **output devices** that act as additional equipment for multimedia technology so to create a virtual environment for the user (3D environment), making his work more attractive and more impressive.

- These multimedia devices include:

  - special joysticks
  - electronic gloves
  - stereoscopic glasses
  - large screens & video projectors
  - high performance audio systems

MULTIMEDIA EQUIPMENT

MULTIMEDIA EQUIPMENT

V. C. Zioulas (IT Teacher)

MULTIMEDIA APPLICATIONS

- **EDUCATION**
    - (educational software, virtual labs)

- **ENTERTAINMENT**
    - (electronic games with 3-D graphics and sound effects)

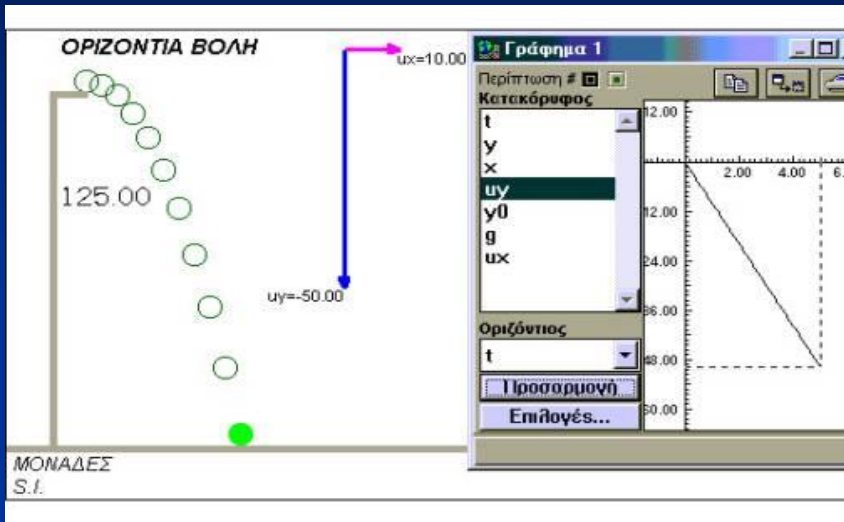- **TOURISM – INFORMATION**
    - (info-kiosks placed in airports, train stations, museums etc.)

- **ADVERTISING - SALES**
    - (on-line stores for shopping and market research)

MULTIMEDIA APPLICATIONS

MULTIMEDIA APPLICATIONS
PC-GAMES

GRAPHICS - IMAGES

- When an image is **digitalized**, it is represented as a **bitmap** (map of bits, **.bmp** files), that means as a number of **pixels** (picture elements) on the screen each of which carries a specific color.

- Image digitalization can be done either through software (e.g. Windows Paint, Photoshop etc.), or hardware input (e.g. scanner, digital camera etc.).

- **Magnification** of a bitmap image leads to quality deterioration, showing sharp defects (coloured square areas are more intense).
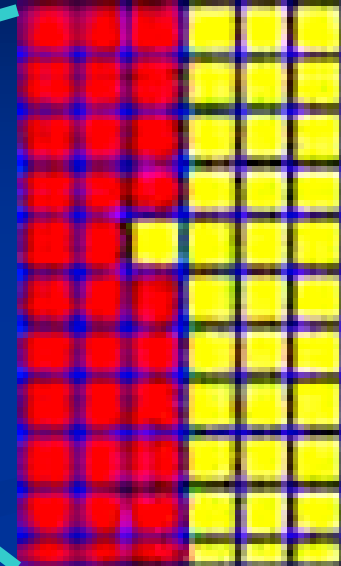
IMAGE RESOLUTION
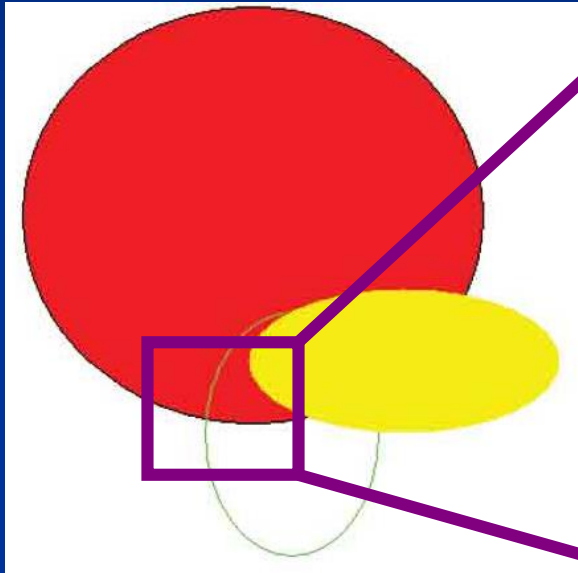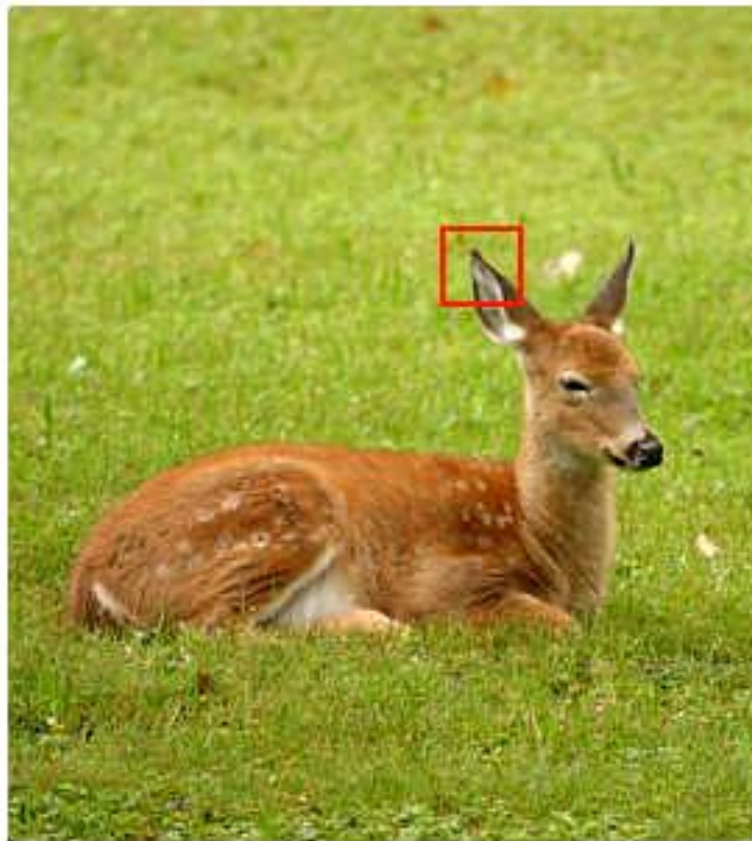
A bitmap image created by Windows Paint
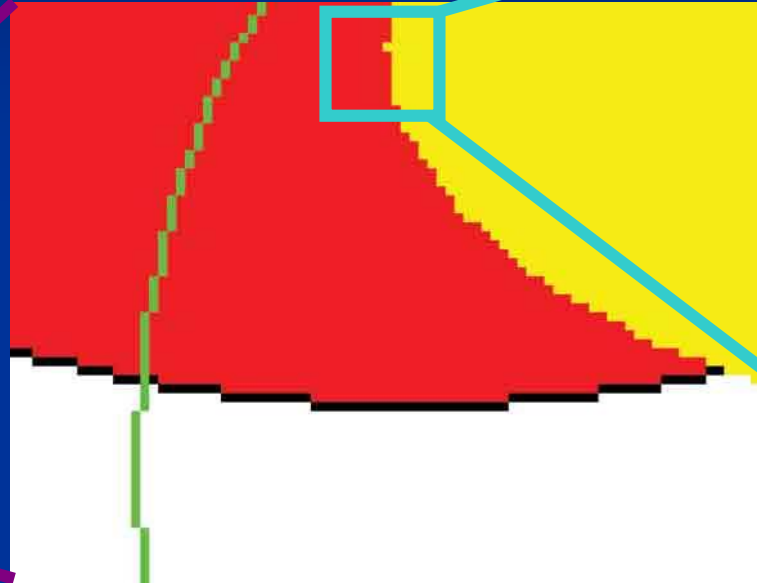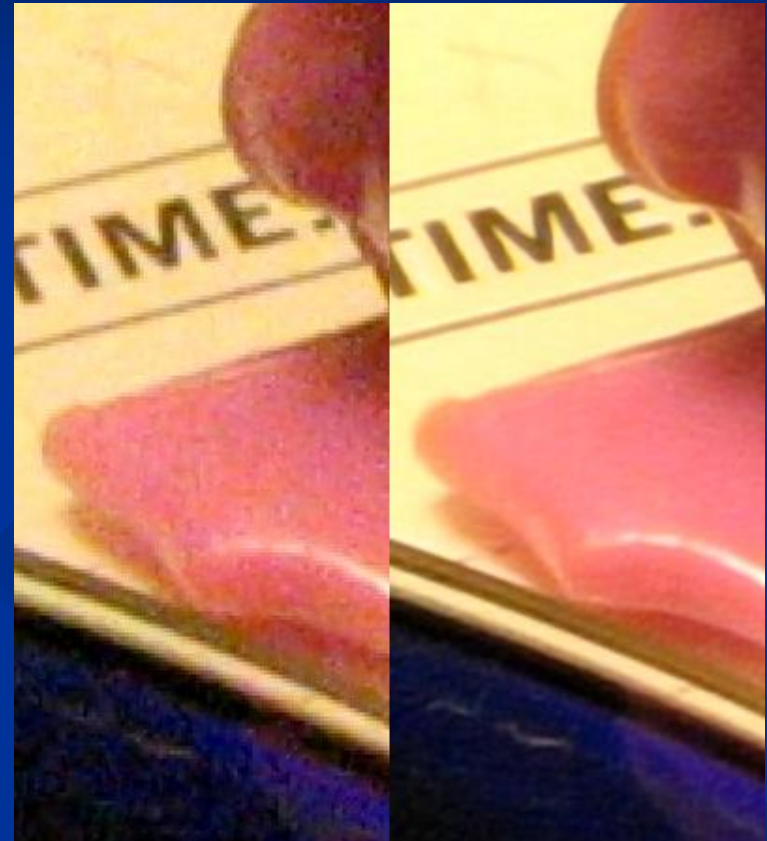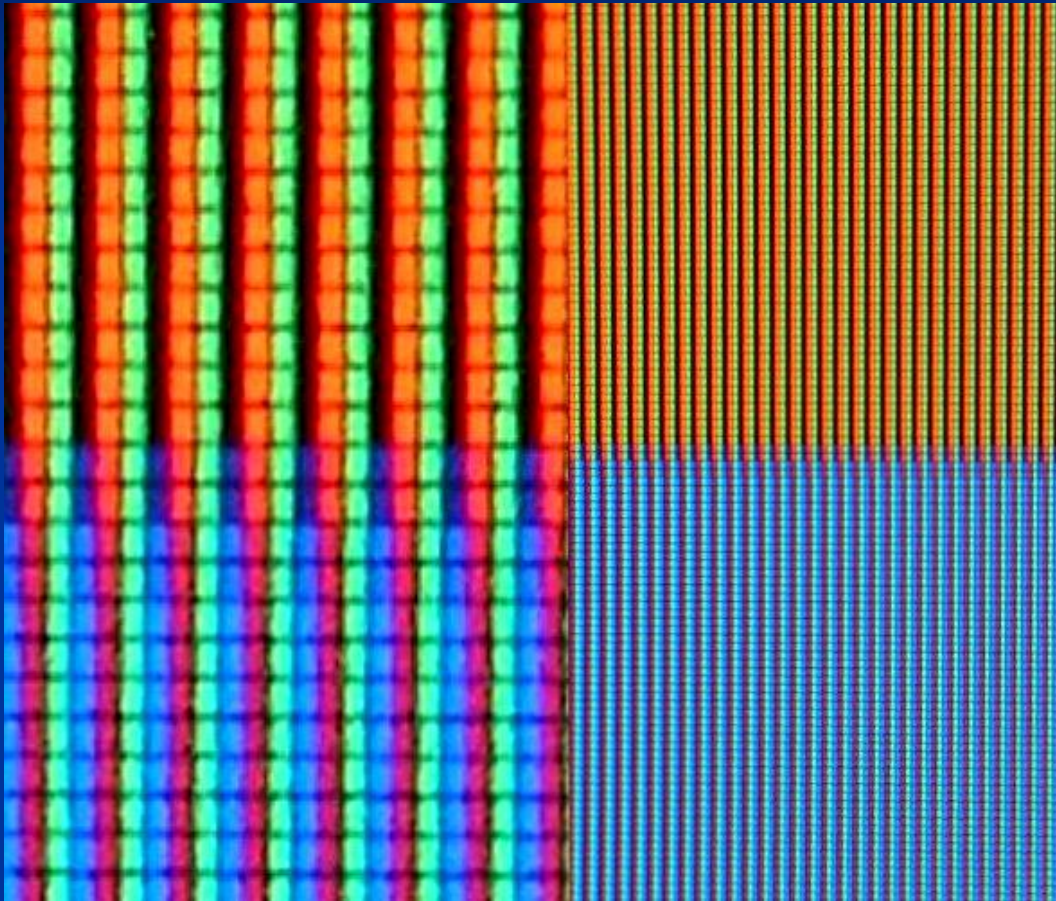
A magnified part of the image

More detail is shown by the image magnification

The **number of pixels** that constitute an image **in each dimension** e.g. 372x175 is known as image resolution. The more pixels on an image, the more detailed it is. This allows users to enlarge it as much possible.
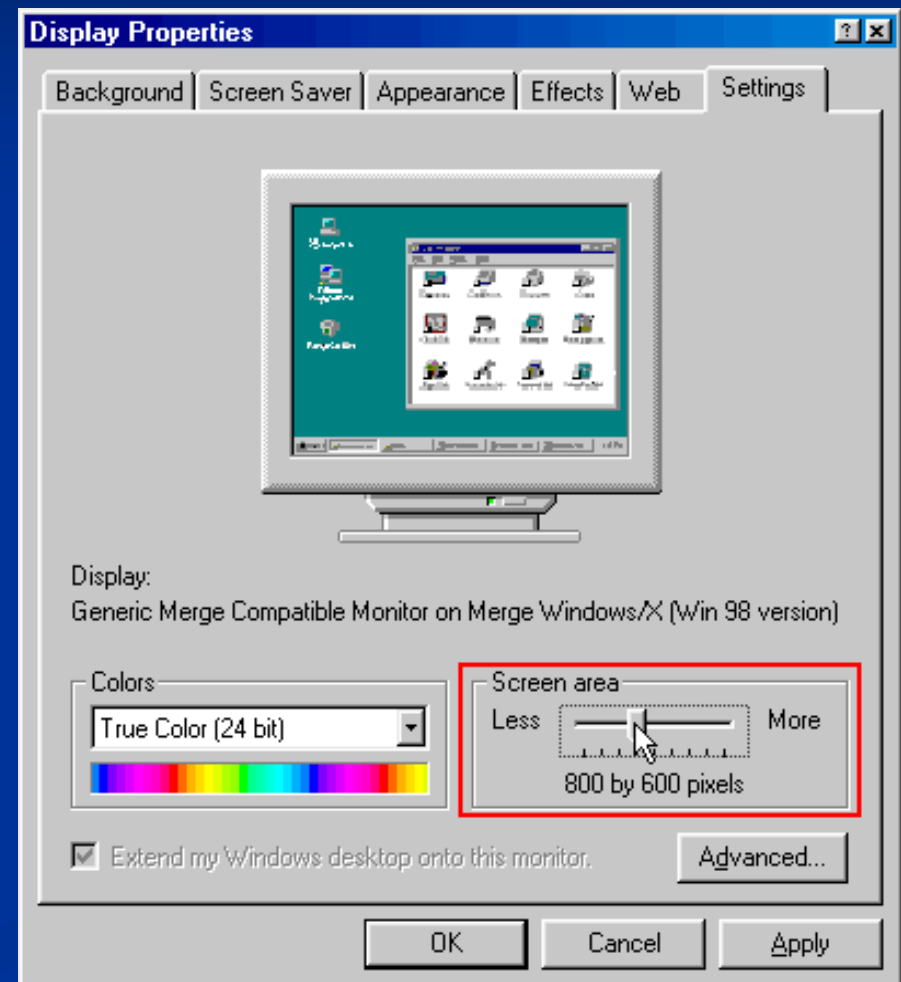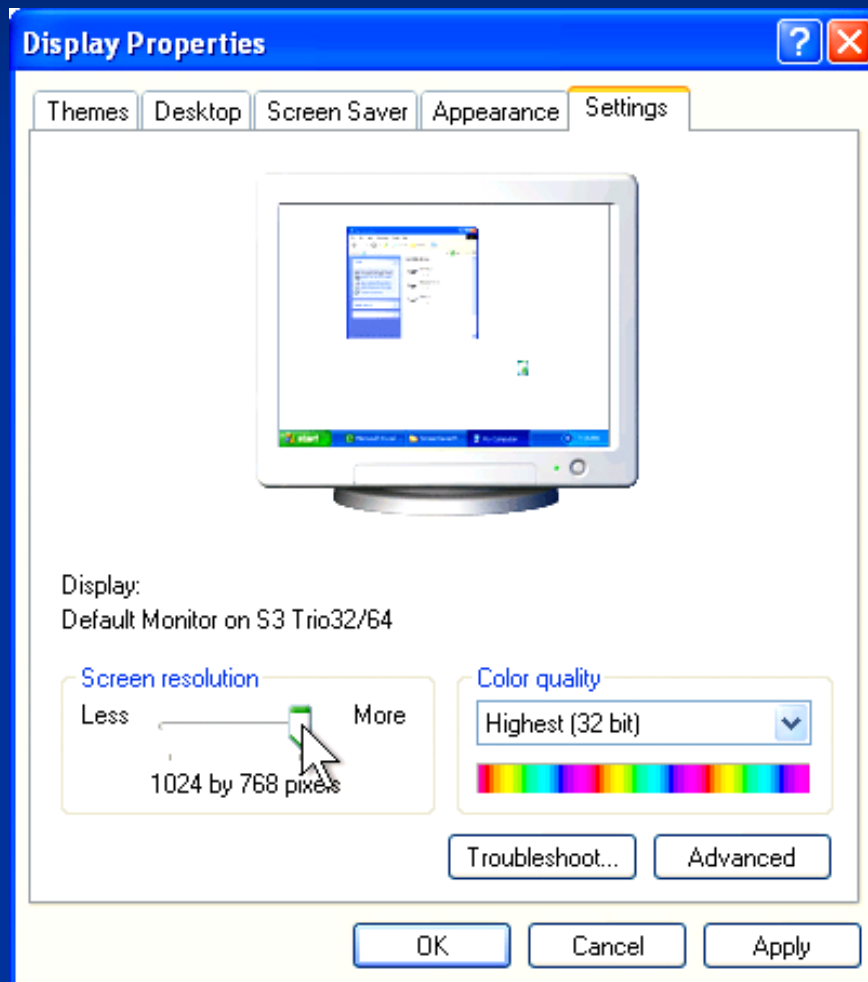
IMAGE RESOLUTION (PIXELS)

IMAGE RESOLUTION

CHANGE THE SCREEN RESOLUTION

Desktop → Right Click → Properties → Settings

COLOUR MODEL

- Each pixel on the screen carries a specific colour which is produced by the combination of 3 basic colours (**RGB model**).

- The basic colours of an RGB model are **Red**, **Green** and **Blue**.

- Each shade of 3 basic colours corresponds to a specific **binary number** (each number is between 0 - 255).

COLOUR MODEL (RGB)

RGB Color Space

R: 213
G: 111
B: 56
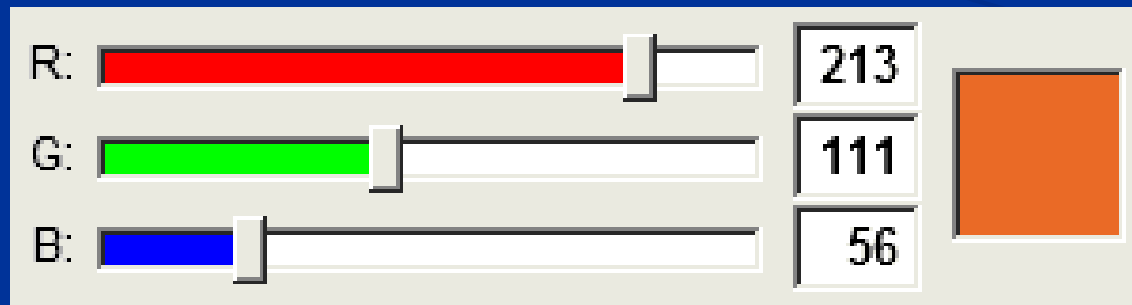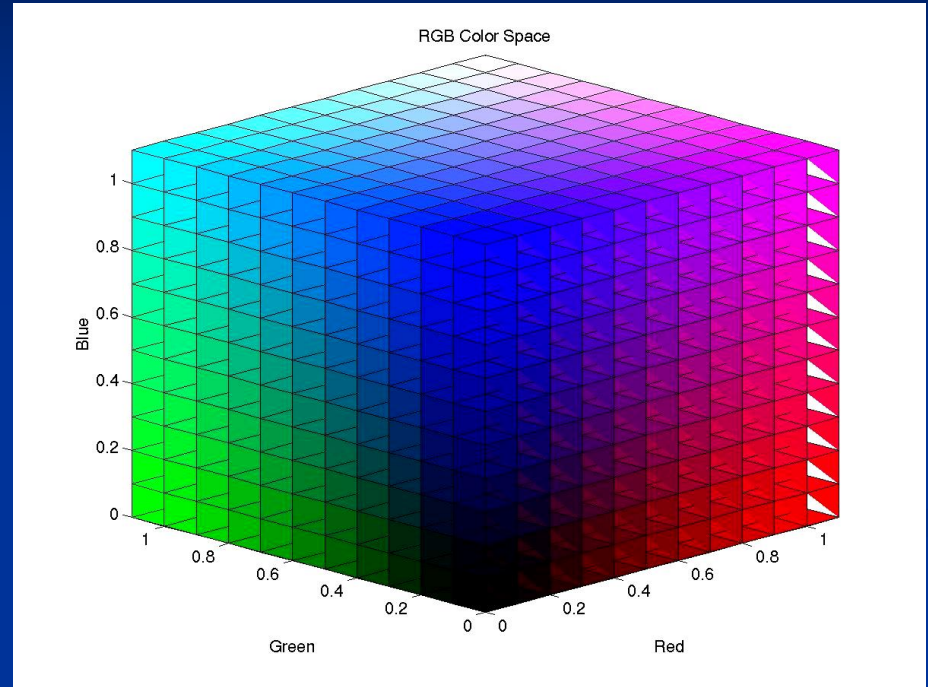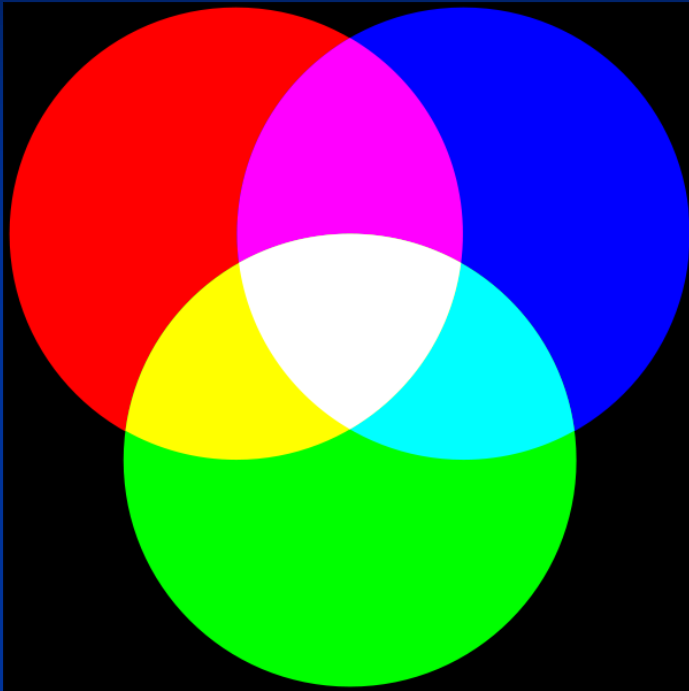
COLOUR DEPTH

- The **number of bits** which are used to represent the colour shade of an individual **pixel** are known as color depth.

- It also indicates the **number of different colours** a computer uses to cover the area of the screen.

Color Depth	Number of Colors
8 bit	256
16 bit	65.536
24 bit	16.777.216
32 bit	4.294.967.296

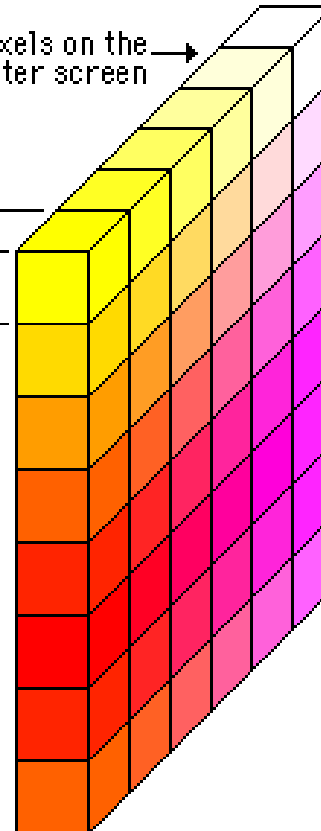# COLOUR DEPTH

8-bit or 256 color displays

Each screen pixel is represented by eight bits of memory.

1 0 1 0 0 0 1 1
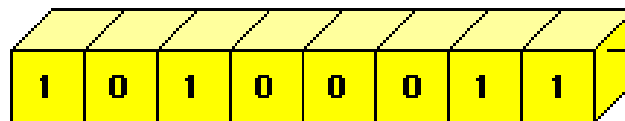
256 colors (Color Look Up Table)

Pixels on the computer screen
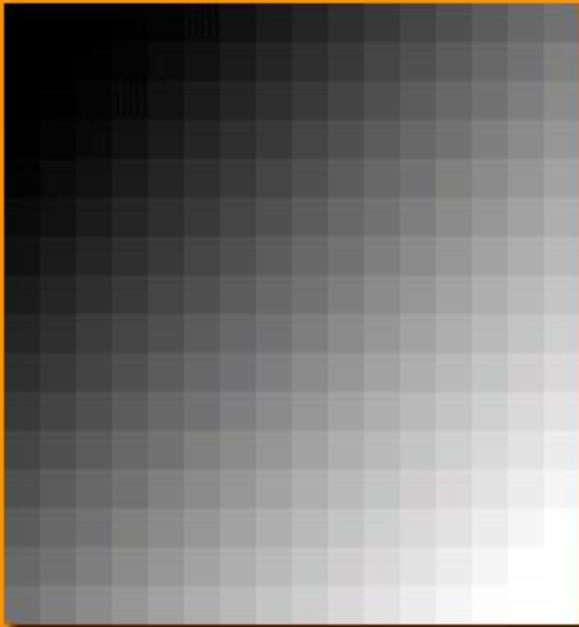
COLOUR DEPTH
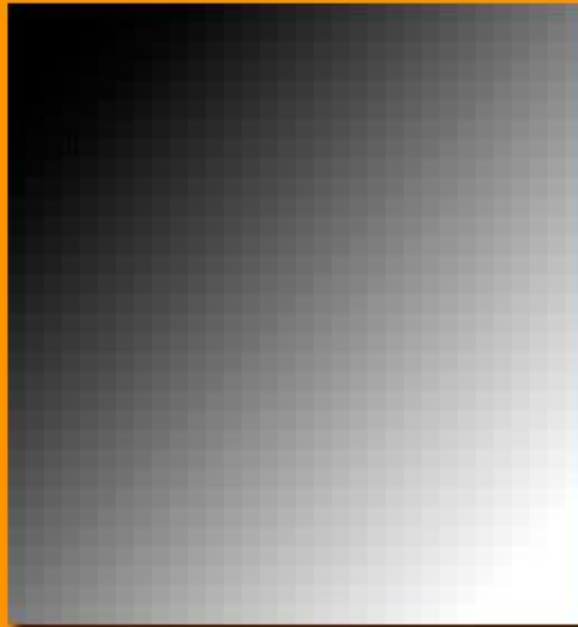
32 bit color

16 bit color
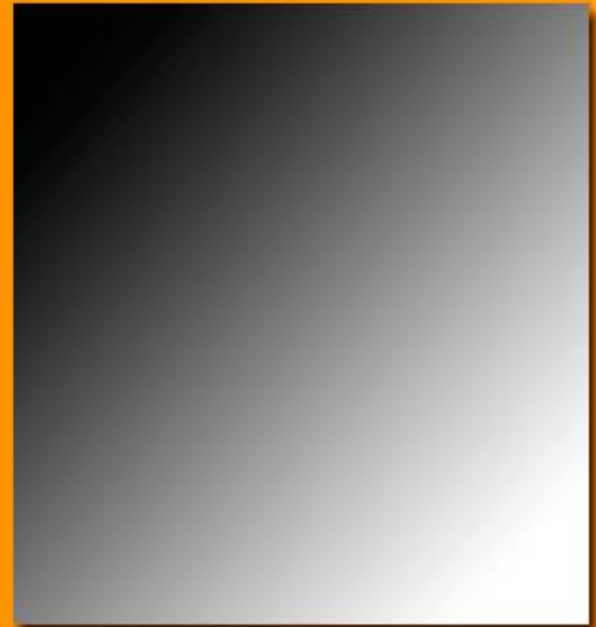
COLOUR DEPTH

8-bit color

10-bit color

16-bit color

IMAGE SIZE

- The **number of bytes** occupied by an image file in a storage device such as a hard disk are referred to as image size.
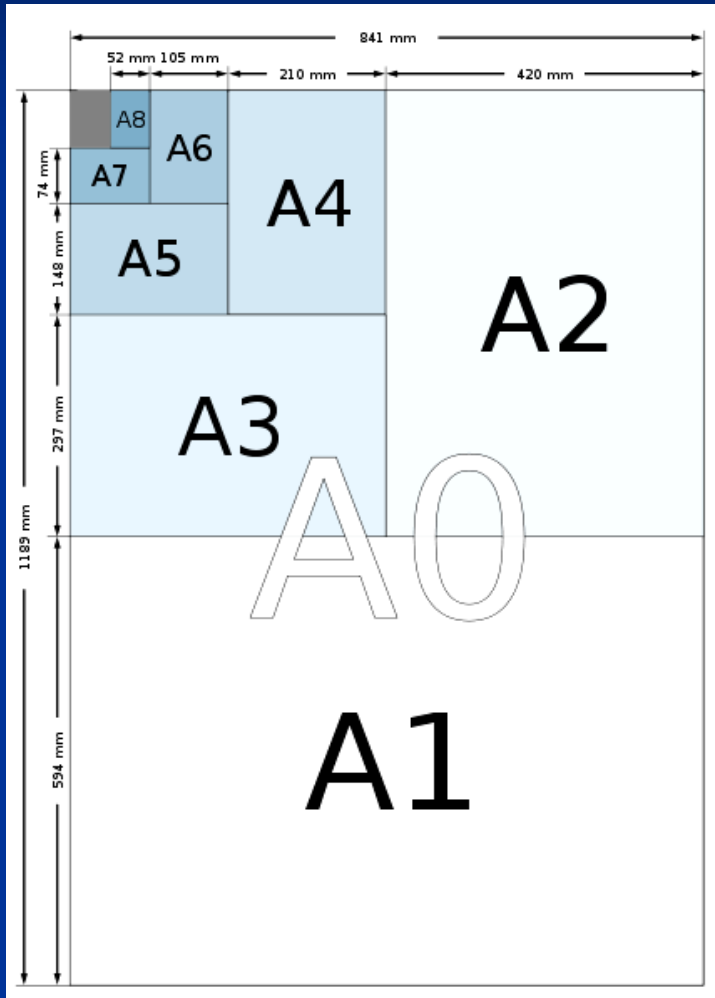
Calculate Image size

Image Size = (Pixels Horizontally) * (Pixels Vertically) * (Color Depth) : 8 bytes

e.g. an image with resolution 1024x768 color depth 16 bits, needs capacity (1024*768*16):8 = 6.291.456 bytes   (image size)
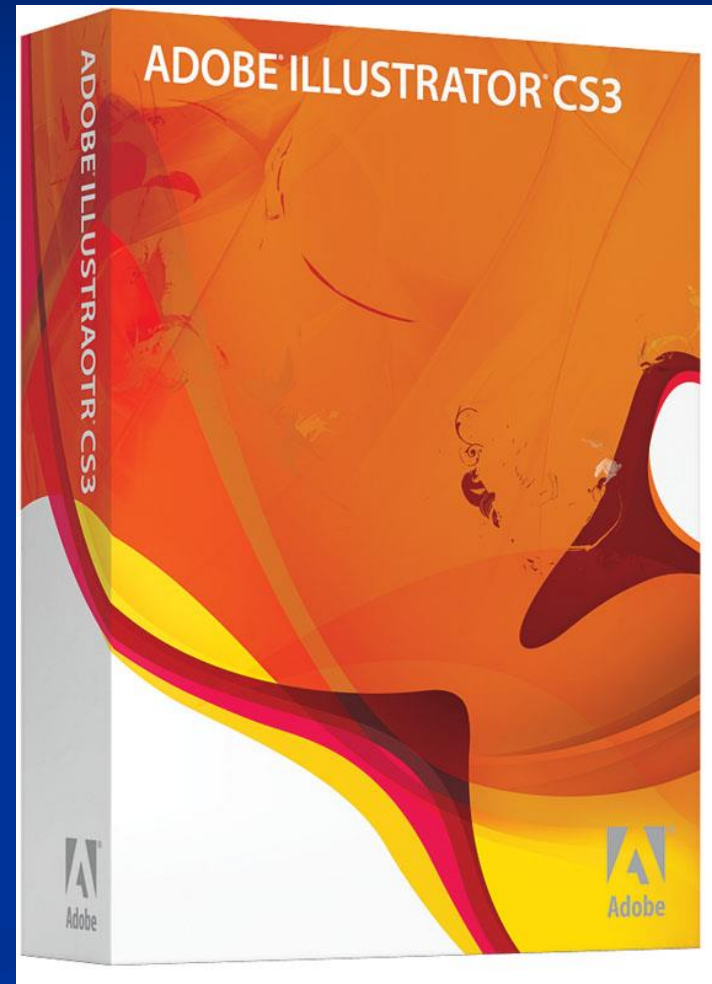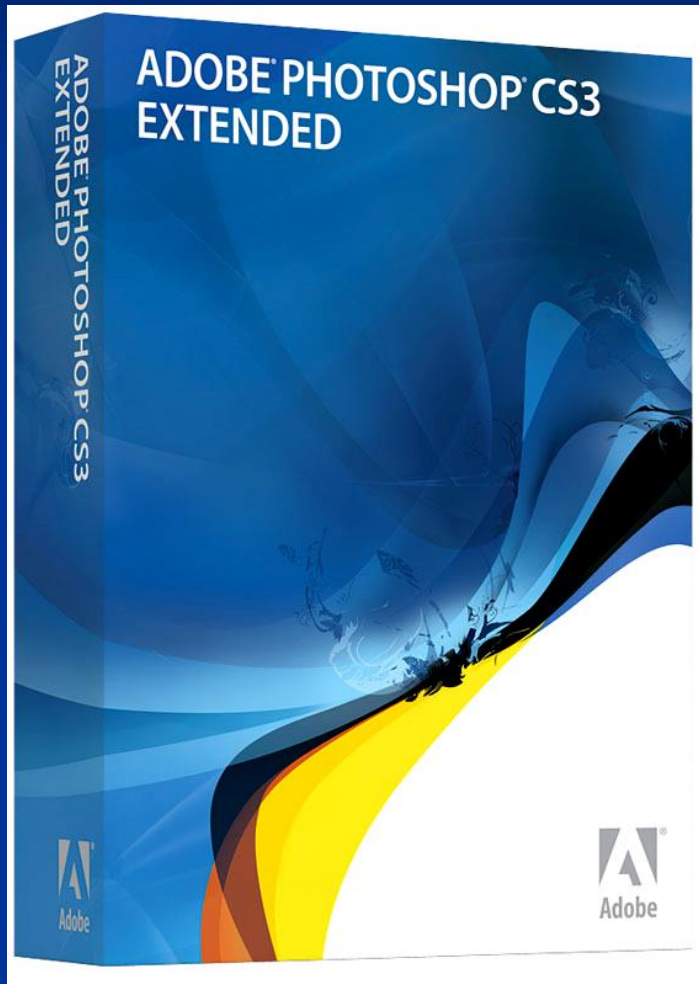
IMAGE SIZE

IMAGE PROCESSING

IMAGE PROCESSING

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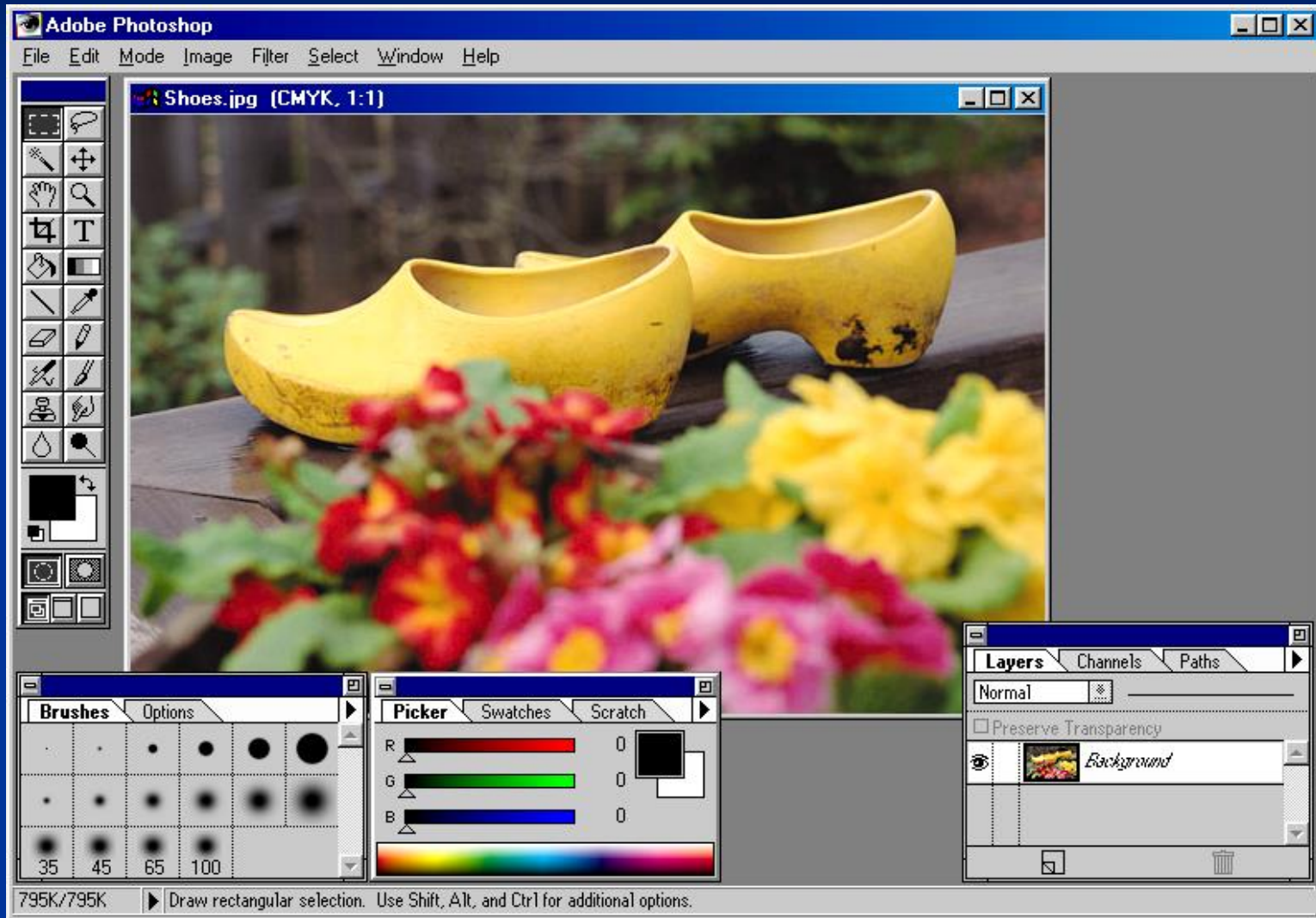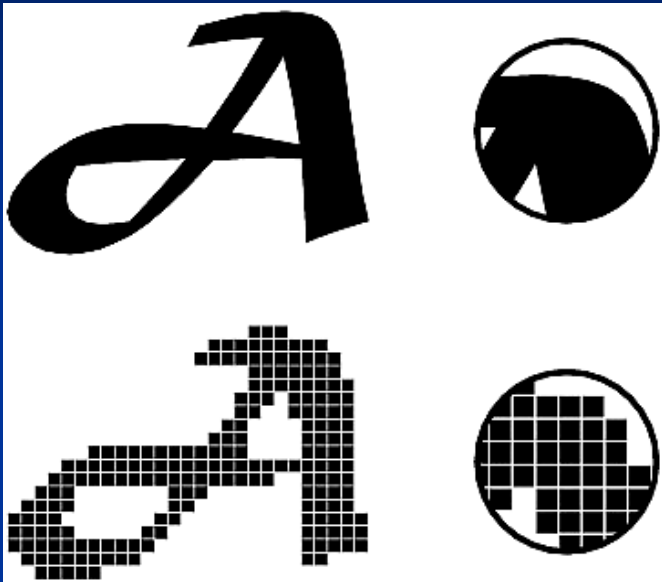
TYPE OF IMAGES

BITMAP IMAGES

They are images **consisted of pixels** (map of bits) and can be distorted when magnified.

VECTOR IMAGES

They are small images that **consist of geometrical shapes** (points, lines, rectangles, ellipses, polygons etc.), which retain their quality after magnification.